Entergy

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10 CFR 50.73

RBG-47964

July 30, 2019

Attn: Document Control Desk
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2738

Subject: Licensee Event Report 50-458 / 2019-003-00, "Manual Reactor Scram Initiated in Response to Loss of Feedwater due to Abnormal Plant Configuration".
River Bend Station, Unit 1
NRC Docket No. 50-458
Renewed License No. NPF-47

In accordance with 10 CFR 50.73, enclosed is the subject Licensee Event Report. This document contains no commitments. If you have any questions, please contact Mr. Tim Schenk at 225-381-4177.

Sincerely,

SPV/twf

Enclosure: Licensee Event Report 50-458 / 2019-003-00, "Manual Reactor Scram Initiated in Response to Loss of Feedwater due to Abnormal Plant Configuration".

cc: NRC Region IV Regional Administrator, w/o Enclosure
NRC Senior Resident Inspector – River Bend Station, Unit 1
Ji Young Wiley, Department of Environmental Quality, Office of Environmental Compliance, Radiological Emergency Planning and Response Section
Public Utility Commission of Texas, Attn: PUC Filing Clerk
NRC Project Manager

NRC FORM 366
(04-2018)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. Facility Name	2. Docket Number	3. Page
River Bend Station – Unit 1	05000 458	1 OF 3

4. Title

Manual Reactor Scram Initiated in Response to Loss of Feedwater due to Abnormal Plant Configuration

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Rev No.	Month	Day	Year	Facility Name	Docket Number
									NA	05000 NA
05	31	2019	2019	003	00	07	30	2019	Facility Name NA	Docket Number 05000 NA

9. Operating Mode	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☑ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. Power Level	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
32	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ Other (Specify in Abstract below or in NRC Form 366A)	

12. Licensee Contact for this LER

Licensee Contact	Telephone Number (Include Area Code)
Tim Schenk, Manager – Regulatory Assurance	225-381-4177

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to ICES	Cause	System	Component	Manufacturer	Reportable to ICES
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

14. Supplemental Report Expected	15. Expected Submission Date	Month	Day	Year
☐ Yes (If yes, complete 15. Expected Submission Date) ☑ No		NA	NA	NA

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On May 31, 2019, the Reactor was operating at 32% power with a planned shutdown in progress. The 'A' Low Pressure Feedwater Heater (LPFH) string was isolated due to level control issues in one of the heaters. The process of securing one of the Reactor Feedwater Pumps (FWP) resulted in higher than anticipated flow through the 'B' LPFH string. The high flow condition caused water level to rise in one of the 'B' LPFHs which resulted in automatic isolation and bypass of the LPFHs. The LPFH string isolation restricted supply flow to the operating FWPs resulting in an automatic trip of the pumps and a loss of all feedwater. At 23:45 a manual Reactor Scram was inserted. Reactor Core Isolation Cooling (RCIC) was manually initiated for Reactor water level control. The 'C' FWP was restarted and Reactor water level control was transferred from RCIC to the 'C' FWP. The LPFH system configuration was not changed and approximately 43 minutes after the Scram, the 'C' FWP automatically tripped due to low suction pressure. Reactor water level lowered to level 3 causing a second Reactor Protection System actuation. Operators reestablished flow through the 'B' LPFH string and restarted the 'A' FWP restoring Reactor water level to the normal band. Corrective Actions are planned to revise procedures to accurately reflect the limitations of the configuration which lead to this event.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. FACILITY NAME	2. DOCKET NUMBER		3. LER NUMBER		
			YEAR	SEQUENTIAL NUMBER	REV NO.
River Bend Station – Unit 1	05000-	458	2019	- 003	- 00

NARRATIVE

REPORTED CONDITION

On May 21, 2019, operators identified a water level control issue in one of the heaters (**HX**) in the 'A' Low Pressure Feedwater Heater (LPFH) string [SD] which required a plant shutdown to correct. However, a plant shutdown was not feasible at the time due to grid power demands. Continued operation with the 'A' LPFH water level control issue presented elevated risk. High LPFH water level initiates an automatic LPFH string isolation and bypass. Simulator scenarios were performed with a LPFH string isolated and bypassed and resulted in core power to flow ratios outside of the normal operating range and feedwater temperature reductions that would require an immediate Reactor Scram. Simulator scenarios performed with a LPFH string isolated and not bypassed resulted in plant parameters acceptable for continued operation.

Trouble shooting activities determined that isolation of the LPFH string would restore the LPFH water level to normal and prevent an unplanned automatic response. An organizational decision was made to lower power and isolate the 'A' LPFH string with the bypass valve closed based on site and fleet engineering input, vendor input, and simulator scenario results. On May 29 the 'A' LPFH string was isolated with the bypass valve closed and water level in the 'A' LPFH returned to normal.

On the night of May 31st, a plant shut down ensued to support maintenance on the 'A' LPFH. The process of securing one of the Reactor Feedwater Pumps (FWP) [SJ] resulted in higher than anticipated flow through the 'B' LPFH string. The high flow condition caused water level to rise in one of the 'B' LPFHs which resulted in automatic isolation of the LPFH 'B' string and bypass of all LPFHs. With the 'A' LPFH string already isolated, supply flow to the FWPs was restricted through the LPFH bypass line. The head loss in the LPFH bypass line was sufficient enough to lower FWP suction pressure below the FWP automatic trip set point. At 23:45 the operating FWPs automatically tripped due to low suction pressure and a manual Reactor Scram was inserted. Reactor Core Isolation Cooling (RCIC) [BN] was manually initiated for Reactor water level control. The 'C' FWP was restarted and Reactor water level control was transferred from RCIC to the 'C' FWP. LPFH system configuration was not changed and approximately 43 minutes after the Scram, the one operating FWP automatically tripped due to low suction pressure. Reactor water level lowered to level 3 initiating a second Reactor Protection System [JC] actuation. Operators reestablished flow through the 'B' LPFH string and restarted the 'A' FWP. Reactor water level was restored to the normal band.

PREVIOUS OCCURRENCE EVALUATION

CAUSAL ANALYSIS

Plant dynamics with one LPFW string isolated were not fully understood.

The station failed to effectively use the Critical Decision Making Process.

Simulator scenario results were used as input in the decision to keep the LPFH bypass valve closed. The station utilizes a plant-reference simulator, meaning its response is modeled based on actual plant operation data. Since the plant had never operated at low power with one LPFH string in service with the LPFH bypass valve closed, there was no previous transient data available for simulator models.

CORRECTIVE ACTION TO PREVENT RECURRENCE

The following actions have been completed to prevent recurrence.

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
River Bend Station – Unit 1	05000- 458	2019	- 003	- 00

NARRATIVE

• A Standing Order was put in place to provide guidance to Operators in a case where a LPFH string must be removed from service.

The following actions have been assigned to prevent a recurrence of this event and are documented in the station's corrective action program.

• Operating procedures will be revised so that they accurately reflect the correct technical data and required operator actions for operation with one LPFW string in service.
• Create and present a Case Study to station leadership to review the management decisions made throughout this event.
• Revise and implement governance for emergent issue identification, adverse condition monitoring, and operational decision making guidelines.

SAFETY SIGNIFICANCE

No plant parameters requiring the automatic actuation of the Standby Diesel Generators [EK] or the Emergency Core Cooling Systems were exceeded. The RCIC system operated properly in response to the operators' manual control and provided high pressure makeup to the Reactor. A Reactor water level 3 signal was received due to the second FWP trip and the plant responded as designed. Control of Reactor pressure was accomplished by rejecting steam to the Main Condenser [SG]. The plant was safely placed in cold shutdown. There were no actual nuclear or radiological safety consequences due to this event. This event was of minimal significance to the health and safety of the public.

(NOTE: Energy Industry Identification System component function identifier and system name of each component or system referred to in the LER are annotated as (**XX**) and [XX], respectively.)